

Mechanisms of Antiulcerogenic Activity of *Costus speciosus* Rhizome Extract in Ethanol-Induced Gastric Mucosal Injury in Rats

Authors : Somayeh Fani, Mahmood Ameen Abdulla

Abstract : *Costus speciosus* is an important Malaysian medicinal plant commonly used traditionally in the treatment of many ailments. The present investigation is designed to elucidate preventive effects of ethanolic extracts of *C. speciosus* rhizome against absolute ethanol-induced gastric mucosal injury in Sprague-Dawley rats. Five groups of rats were orally pre-treated with vehicle, carboxymethylcellulose (CMC) as normal control group (Group 1), ethanol as ulcer control group (Group 2), omeprazole 20 mg/kg (reference group) (Group 3), and 250 and 500 mg/kg of *C. speciosus* extract (experimental groups) (Group 4 and 5), respectively. An hour later, CMC was given orally to Group 1 rats and absolute ethanol was given orally to Group 2-5 rats to generate gastric mucosal injury. After an additional hour, the rats were sacrificed. Grossly, ulcer control group exhibited severe of gastric mucosal hemorrhagic injury and increased in ulcer area, whereas groups pre-treated with omeprazole or plant's rhizomes exhibited the significant reduction of gastric mucosal injury. Significant increase in the pH and mucus of gastric content was observed in rats re-treated with *C. speciosus* rhizome. Histology, ulcer control rats, demonstrated remarkable disruption of gastric mucosa, increased in edema and inflammatory cells infiltration of submucosal layer compared to rats pre-treated with rhizomes extract. Periodic acid Schiff staining for glycoprotein, rats pre-fed with *C. speciosus* C. displayed remarkably intense uptake of magenta color by glandular gastric mucosa compared with ulcer control rats. Immunostaining of gastric epithelium, rats pre-treatment with rhizome extract provide evidence of up-regulation of HSP70 and down-regulation of Bax proteins compared to ulcer control animals. Gastric tissue homogenate, *C. speciosus* significantly increased the activity of superoxide dismutase (SOD), and catalase (CAT), increased the level of non-protein sulfhydryl (NP-SH) and decreased the level of lipid peroxidation after ethanol administration. Acute toxicity test did not show any signs of toxicity. The mechanisms implicated the gastroprotective property of *C. speciosus* depend upon the antisecretory activity, increased in gastric mucus glycoprotein, up-regulation of HSP70 protein and down-regulation of Bax proteins, reduction in the lipid peroxidation and increase in the level of NP-SH and antioxidant enzymes activity in gastric homogenate.

Keywords : antioxidant, *Costus speciosus*, gastric ulcer, histology, omeprazole

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